REMARKS

In the non-final Office Action, the Examiner rejects claims 1, 3, 16, 19, 22-25, and 29 under 35 U.S.C. § 103(a) as unpatentable over GARDNER et al. ("Techniques for Finding Ring Covers in Survivable Networks," Proceedings on IEEE GLOBECOM; 1994, hereafter GARDNER) in view of GROVER et al. (U.S. Patent No. 6,819,662, hereinafter GROVER); rejects claims 2, 9-13, 17, and 30 under 35 U.S.C. § 103(a) as unpatentable over GARDNER in view of GROVER and CHOW et al. (U.S. Patent No. 7,133,410, hereafter CHOW); and rejects claims 4-8, 18, 21, and 26-28 under 35 U.S.C. § 103(a) as unpatentable over GARDNER in view of GROVER and KENNINGTON et al. ("Optimization Based Algorithms for Finding Minimal Cost Ring Covers in Survivable Networks, "*Computational Optimization and Applications, 14*; 1999, hereinafter KENNINGTON). Applicants respectfully traverse these rejections. Claims 1-13, 16-19, and 21-30 are pending.

Rejection under 35 U.S.C. § 103(a) based on GARDNER and GROVER

Claims 1, 3, 16, 19, 22-25, and 29 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over GARDNER in view of GROVER. Applicants respectfully traverse this rejection.

Independent claim 1 recites a processor-implemented method for designing a ring cover candidate for a network. The method includes receiving, at the processor, network configuration information and traffic demand information for the network; generating, by the processor, a plurality of ring cover candidates, each ring cover candidate including a plurality of rings, based on the network configuration information and the traffic demand information, each of the rings including a plurality of network spans, where the

generating the ring cover candidate includes generating the plurality of ring cover candidates by using a different process to generate each of the ring cover candidates; counting, for each ring cover candidate of the plurality of ring cover candidates, a number of loaded network spans covered by the ring cover candidate; and selecting one of the plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans. GARDNER and GROVER, whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, GARDNER and GROVER do not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1. The Examiner admits that GARDNER does not disclose this feature and relies on the abstract; column 12, lines 1-10 and 34-65; column 29, lines 55-67; column 30, lines 24-33; and column 32, lines 12-15 of GROVER as allegedly disclosing this feature of claim 1 (Office Action, pp. 3-4). Applicants respectfully disagree with the Examiner's interpretation of GROVER.

In the abstract, GROVER discloses:

> A method of connecting a telecommunications network, in which the network is formed of plural nodes connected by plural spans. Each node has a nodal switching device for making connections between adjacent spans meeting at the node. Method steps A-F are followed. A) Select a set of candidate rings, each candidate ring being formed of nodes connected by spans, the candidate rings each being capable of serving a number of demands and having a ring construction cost C. B) Assess the total transport utility U of each candidate ring, wherein the total transport utility is a measure of at least the number of demands served by the respective candidate ring. C) Assess the construction cost of each candidate ring. D) Calculate a ratio formed of U/C for each candidate ring. E) Choose, from the set of candidate rings, a best set of candidate rings, wherein candidate rings in the best set of candidate rings have a higher ratio of U/C than

> candidate rings not in the best set. F) Forming rings in the network that are selected from the best set of candidate simple rings.

This section of GROVER discloses choosing a best set of candidate rings based on the ratio of total transport utility (U) to ring construction cost (C) for each candidate ring. This section of GROVER does not disclose selecting a ring cover candidate based on a number of loaded network spans. In fact, this section of GROVER does not disclose loaded network spans at all. Therefore, this section of GROVER does not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1.

At column 23, lines 1-10, GROVER discloses:

> Following identification of the essential spans as above, IRE begins. IRE needs to be described at two logical levels: one is a low-level iteration at which a single non-essential span is eliminated, the demand matrix is routed in a shortest-path (or MAPR-like) way on the remaining graph, a ring coverage design is obtained, and the resulting design cost is saved. Above this, a breadth-first search is in effect to develop a sequence of accumulating eliminations from the set of non-essential spans.

This section of GROVER discloses that Iterated Routing and Elimination (IRE) involves a low-level iteration at which a single non-essential span is eliminated, the demand matrix is routed in a shortest-path way on the remaining graph, a ring coverage design is obtained, and the resulting design cost is saved. This section of GROVER does not disclose selecting a ring cover candidate based on a number of loaded network spans. In fact, this section of GROVER does not disclose loaded network spans at all. Therefore, this section of GROVER does not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1.

At column 23, lines 34-65, GROVER discloses that RingBuilder uses a greedy method, which selects from modular ring candidate systems for the network design to achieve a near-optimal placement of ring systems on a network. This section of GROVER further discloses that Span Coverage Integer Program (SCIP) finds the strictly min-cost single-modularity ring set required to cover all the non-zero span working capacities in a network with rings. This section of GROVER does not disclose selecting a ring cover candidate based on a number of <u>loaded network spans</u>. Therefore, this section of GROVER does not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1.

At column 29, lines 55-67, GROVER discloses:

> The loading heuristic attempts to pick the best possible set of demand segments in order to make the loaded cycle 164 as appealing as possible to the cycle evaluator. The cycle evaluator chooses the best loaded cycle, and that cycle becomes a ring in the network design.
>
> The cycle data structure and the route data structure are persistent; they remain in existence throughout the entire design. Every time a new ring is chosen in the design, the route data structure is updated to reflect the fact that some route segments that have been loaded and thus do not have to be considered again for loading onto subsequent rings.
>
> FIG. 22 shows the loaded route data structure 166 that is created when a loaded cycle data structure is built for evaluating a cycle.

This section of GROVER discloses that the loaded heuristic attempts to pick the best possible set of demand segments in order to make a loaded cycle as appealing as possible to a cycle evaluator. This section of GROVER further discloses that the cycle evaluator chooses the best loaded cycle, and that cycle becomes a ring in the network design. This section of GROVER does not disclose that the best loaded cycle includes having a highest number of loaded network spans. In fact, as noted above, GROVER discloses

choosing a best set of candidate rings based on the ratio of total transport utility (U) to ring construction cost (C) for each candidate ring (abstract). Therefore, this section of GROVER does not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1.

At column 30, lines 24-33, GROVER discloses:

> For each cycle being loaded, a non-persistent loaded cycle data structure is created; this data structure only exists until the candidate loaded cycle is loaded and evaluated. If the loaded cycle is the best loaded cycle evaluated, it is nominated to be the `best loaded cycle`; otherwise it is discarded. If the loaded cycle is better than an existing best loaded cycle, the current best loaded cycle is discarded and the new loaded cycle replaces it as the `best loaded cycle`. The `best loaded cycle` that remains after all of the cycles have been evaluated is the one that becomes a ring in the design.

This section of GROVER discloses that a 'best loaded cycle' that remains after all of the cycles have been evaluated is the one that becomes a ring in the design. This section of GROVER does not disclose that the best loaded cycle includes having a highest number of loaded network spans. In fact, as noted above, GROVER discloses choosing a best set of candidate rings based on the ratio of total transport utility (U) to ring construction cost (C) for each candidate ring (abstract). Therefore, this section of GROVER does not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1.

At column 32, lines 12-15, GROVER discloses that, once all of the cycles have been evaluated, the best cycle found is committed as a ring in the design in the Commit Ring module, which updates the persistent route data structure and also the span2Route data structure. This section of GROVER does not disclose selecting a ring cover

candidate based on a number of loaded network spans. In fact, this section of GROVER does not disclose loaded network spans at all. Therefore, this section of GROVER does not disclose or suggest selecting one of a plurality of ring cover candidates as a recommended ring cover candidate by selecting the one of the ring cover candidates having a highest number of loaded network spans, as recited in claim 1.

For at least the foregoing reasons, Applicants submit that claim 1 is patentable over GARDNER and GROVER, whether taken alone or in any reasonable combination.

Claim 3 depends from claim 1. Therefore, this claim is patentable over GARDNER and GROVER, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 1.

Independent claims 16, 23, and 24 recite features similar to, yet possibly of different scope than, features recited above with respect to claim 1. Therefore, these claims are patentable over GARDNER and GROVER, whether taken alone or in any reasonable combination, for at least reasons similar to the reasons given above with respect to claim 1.

Claims 19 and 22 depend from claim 16. Therefore, these claims are patentable over GARDNER and GROVER, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 16.

Claims 25 and 29 depend from claim 24. Therefore, these claims are patentable over GARDNER and GROVER, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claim 24.

Rejection under 35 U.S.C. § 103(a) based on GARDNER, GROVER and CHOW

Claims 2, 9-13, 17, and 30 stand rejected under 35 U.S.C. § 103(a) as unpatentable over GARDNER in view of GROVER and CHOW. Applicants respectfully traverse this rejection.

Claims 2 and 9-13 depend from claim 1; claim 17 depends from claim 16; and claim 30 depends from claim 24. Without acquiescing in the Examiner's rejection of claims 2, 9-13, 17, and 30, Applicants respectfully submit that the disclosure of CHOW does not remedy the deficiencies in the disclosures of GARDNER and GROVER set forth above with respect to claims 1, 16, and 24. Therefore, claims 2, 9-13, 17, and 30 are patentable over GARDNER, GROVER, and CHOW, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claims 1, 16, and 24. Moreover, claims 2, 9-13, 17, and 30 recite additional features not disclosed or suggested by GARDNER, GROVER, and CHOW.

Rejection under 35 U.S.C. § 103(a) based on GARDNER, GROVER and KENNINGTON

Claims 4-8, 18, 21, and 26-28 stand rejected under 35 U.S.C. § 103(a) as unpatentable over GARDNER in view of GROVER and KENNINGTON. Applicants respectfully traverse this rejection.

Claims 4-8 depend from claim 1; claims 18 and 21 depend from claim 16; and claims 26-28 depend from claim 24. Without acquiescing in the Examiner's rejection of claims 4-8, 18, 21, and 26-28, Applicants respectfully submit that the disclosure of KENNINGTON does not remedy the deficiencies in the disclosures of GARDNER and GROVER set forth above with respect to claims 1, 16, and 24. Therefore, claims 4-8, 18,

21, and 26-28 are patentable over GARDNER, GROVER, and CHOW, whether taken alone or in any reasonable combination, for at least the reasons given above with respect to claims 1, 16, and 24. Moreover, these claims recite additional features not disclosed or suggested by GARDNER, GROVER, and CHOW.

For example, claim 8 recites generating a first ring cover candidate by using cheapest ones of the rings formed on loaded network spans, generating a second ring cover candidate by using cheapest ones of the rings formed on a maximum number of uncovered network spans, and generating a third ring cover candidate by using cheapest ones of the rings from the first ring cover candidate. GARDNER, GROVER, and CHOW, whether taken alone or in any reasonable combination, do not disclose or suggest one or more of these features.

For example, GARDNER, GROVER, and CHOW do not disclose or suggest generating a first ring cover candidate by using cheapest ones of the rings formed on loaded network spans and generating a second ring cover candidate by using cheapest ones of the rings formed on a maximum number of uncovered network spans. The Examiner has not pointed to any sections of GARDNER, GROVER, or CHOW as disclosing these features. As such, a prima facie case of obviousness has not been established with regard to claim 8.

For at least this additional reason, Applicants submit that claim 8 is patentable over GARDNER, GROVER, and CHOW, whether taken alone or in any reasonable combination.

Conclusion

In view of the foregoing remarks, Applicants respectfully request the Examiner's reconsideration of the application and the timely allowance of the pending claims.

As Applicants' remarks with respect to the Examiner's rejections overcome the rejections, Applicants' silence as to certain assertions by the Examiner in the Office Action or certain requirements that may be applicable to such assertions (e.g., whether a reference constitutes prior art, reasons for modifying a reference and/or combining references, assertions as to dependent claims, etc.) is not a concession by Applicants that such assertions are accurate or that such requirements have been met, and Applicants reserve the right to dispute these assertions/requirements in the future.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-1070 and please credit any excess fees to such deposit account.

Respectfully submitted,

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